24. (Twice Amended) A semiconductor transistor formed on a silicon substrate, comprising:

a $Si_{1-x}Ge_x$ channel region, having a germanium molar fraction of x, and formed in the substrate, underneath and [adjacent]adjoining a gate oxide and between a source region and a drain region;

wherein the $Si_{1-x}Ge_x$ channel region has a channel length less than 7μm.

25. (Once Amended) A semiconductor transistor formed on a silicon substrate, comprising:

a $Si_{1-x}Ge_x$ channel region, having a germanium molar fraction of x, and formed in the substrate, underneath a gate oxide and between a source region and a drain region without a silicon layer interposed between the $Si_{1-x}Ge_x$ channel region and the gate oxide;

wherein the $Si_{1-x}Ge_x$ channel region is formed from ion implanting germanium (Ge) into the substrate at a dose of approximately $2 \times 10^{16}$ atoms/cm$^2$, and wherein the Ge is implanted at an energy of approximately 20 to 100 keV; and

wherein the $Si_{1-x}Ge_x$ channel region has a channel length less than 7μm.

28. (Twice Amended) A semiconductor transistor formed on a silicon substrate, comprising:

a $Si_{1-x}Ge_x$ channel region, having a germanium molar fraction of 0.2, and formed in the substrate, underneath and [adjacent]adjoining a gate oxide and between a source region and a drain region;

wherein the $Si_{1-x}Ge_x$ channel region has a channel length less than 7μm.

30. (Twice Amended) A transistor on a silicon substrate, wherein the transistor includes a channel comprising a silicon-germanium (Si-Ge) alloy underneath and [adjacent]adjoining a gate oxide, wherein the channel has a channel length less than 7μm.